No. 9000107

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Michigan State University

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

BEAN

'Blackhawk'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D.C. *this* 30th *day of* April *in the year of our Lord one thousand nine hundred and* ninety-three.

Attest:

Kenneth A. Evans

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

APPROVAL EXPIRES 2-28-88

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION	3. VARIETY NAME
Michigan State University	B83302	Blackhawk

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*	5. PHONE *(Include area code)*	FOR OFFICIAL USE ONLY PVPO NUMBER
East Lansing, MI 48824	(517) 353-9545	9000107

6. GENUS AND SPECIES NAME	7. FAMILY NAME *(Botanical)*	FILING DATE / TIME
Phaseolus vulgaris L.	Leguminosae	Mar. 1, 1990 ☐ A.M. ☐ P.M.

8. KIND NAME	9. DATE OF DETERMINATION	FEES RECEIVED
Black field bean	December 12, 1989	AMOUNT FOR FILING $ 2150.00 DATE Mar. 1, 1990 AMOUNT FOR CERTIFICATE $ 250.00 DATE Apr. 15, 1993

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*

University

11. IF INCORPORATED, GIVE STATE OF INCORPORATION	12. DATE OF INCORPORATION
Michigan	

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS

L.O. Copeland
278 Plant and Soil Sciences Bldg.
Michigan State University

East Lansing, MI 48824
(517) 353-9545

PHONE *(Include area code)*:

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED

a. ☒ Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
b. ☒ Exhibit B, Novelty Statement.
c. ☒ Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
d. ☐ Exhibit D, Additional Description of Variety.
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* ☒ Yes *(If "Yes," answer items 16 and 17 below)* ☐ No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
☒ Yes ☐ No	☒ Foundation ☐ Registered ☒ Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

☐ Yes *(If "Yes," give date)*
☒ No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?

☐ Yes *(If "Yes," give names of countries and dates)*
☒ No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT	DATE
L.O. Copeland	Feb 13, 1990
SIGNATURE OF APPLICANT	DATE

1

FORM LS-470 (3-86) *Edition of 7-84 obsolete.*

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF THE VARIETY BLACKHAWK

Blackhawk, formerly known and tested as MSU No. B83302, was derived from the following sequence of crosses which were concluded in 1980 and coded 80B015:

'Tuscola'/CN49-242//'Black Magic'/3/'Midnight'

The original cross between Tuscola and Cornell University breeding line 49-242 was made by Madata nee Muhalet* to study the inheritance of resistance to different races of bean anthracnose. Anthracnose is a seed-borne fungal disease incited by Colletotrichum lindemuthianum (Sacc. & Magn.) Scrib., and breeding line 49-242 carries the 'ARE' gene for resistance to six races of anthracnose, Anthracnose resistant black seeded F_3 segregants were intermated with the commercial black bean cultivar Black Magic and subsequently with Midnight to improve both architectural and agronomic performance of the progeny. The final cross 80B015 was advanced to the F_2 generation where a single plant selection no. 68 was made for plant habit, architecture, maturity, and seed type in field trials in 1981. The F_3 progeny of selection no. 68 were screened against two races (alpha and delta) of anthracnose in the greenhouse to detect those individuals carrying the dominant resistant ARE gene. An F_3 selection no. 2 was advanced as an F_4 row in the field in 1982 and single plant selections were made for agronomic, architectural, and seed traits. These selections were increased in a winter nursery program in Puerto Rico (1982/1983) during which time the same remnant materials were screened in the greenhouse to detect progeny carrying homozygous ARE resistance and only the resistant progeny were returned to Michigan from Puerto Rico. Selection number 80B015-68-02-02 entered yield trials in Saginaw MI as an F_6 generation breeding line in 1983 and was coded with the permanent accession number B83302.

---

*Muhalet, C.S., M.W. Adams, A.W. Saettler, and A. Ghaderi. 1981. Genetic systems for the reaction of field beans to beta, gamma and delta races of Colletotrichum lindemuthianum. J. Amer. Soc. Hort. Sci. 106(5):601-604.

FIGURE 3
ATTACHMENT TO:
EXHIBIT A-ORIGIN AND BREEDING HISTORY
BLACKHAWK
PV APPLICATION NO. 9000107

Observations indicate Blackhawk released as an F9 generation pure line bean variety is uniform and stable within commercially acceptable limits. As is true with other black turtle bean varieties, a small percentage of offtypes or variants can occur within commercially acceptable limits for almost any characteristic during the course of repeated multiplication.

FIGURE 4
EXHIBIT B-NOVELTY STATEMENT

Blackhawk is most similar to Midnight. Blackhawk differs from Midnight in that it possesses the Are gene which conditions resistance to alpha, beta, gamma, delta race of bean anthracnose caused by *Colletotrichum lindemuthianum*. Midnight is susceptible to the alpha race.

	Anthracnose Race			
Variety	Alpha	Beta	Gamma	Delta
Blackhawk	R	R	R	R
Midnight	S	R	R	R

R=Resistant; S=Susceptible

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK AND SEED DIVISION

Exhibit (

OBJECTIVE DESCRIPTION OF VARIETY
Dry Edible Bean (Phaseolus vulgaris L.)

NAME OF APPLICANT(S)	EXPERIMENTAL NAME	VARIETY NAME
Michigan Agricultural Experiment Station	B83-302	Blackhawk

ADDRESS (Street and No. or R.F.D. No., City, State, ZIP)
101 Agriculture Hall
Michigan State University
East Lansing, MI 48824

FOR OFFICIAL USE ONLY
PVPO NO. 9000107

Provide data for all characters unless indicated as "optional." Place numbers in the boxes for the characters or numerical values which best describe this variety. Measured data should be the mean of an appropriate number of well spaced (15-20 cm) plants. The Royal Horticultur Society or any recognized color standard may be used to determine plant color. Designate the color system used below.

COLOR SYSTEM USED

LOCATION OF THE TEST(S) TO EVALUATE THIS VARIETY

1. MARKET CLASS

[0 3]

CLASS	CHECK
1 = Navy (Pea)	Seafarer
2 = Small White	Aurora
3 = Black	Midnight
4 = Pinto	UI-114
5 = Great Northern	UI-59
6 = Small Red	NW-59
7 = Pink	Viva
8 = Cranberry	UI-50
9 = Dark Red Kidney	Montcalm
10 = Light Red Kidney	Redkloud
11 = Yellow Eye	Steuben
12 = Other (specify)	

2. MATURITY

[3] 1 = Early (80-90 days); 2 = Medium (90-100 days); 3 = Late (>100 days)

[1 0 1] Days from planting to harvest maturity

[ ] Heat units from planting to harvest maturity (optional). Specify base temperature used: _____

[9 7] Days from planting to harvest maturity of check variety (use check appropriate to market class shown in item 1)

3. PLANT HABIT

[3]

TYPE
1 = Ia Bush-determinate, strong and erect stem and branches
2 = Ib Bush-determinate, weak stem and branches
3 = IIa Erect growth habit-indeterminate, guides (runners) short or not developed
4 = IIb Erect growth habit-indeterminate, guides medium to long, with no ability to climb
5 = IIIa Vine-indeterminate, short guides with no ability to climb
6 = IIIb Vine-indeterminate, long guides with ability to climb
7 = IVa Indeterminate climbing, pods distributed throughout the plant
8 = IVb Indeterminate climbing, pods concentrated on the upper part of the plant

[5 1] Average height of mature plant, in cm.

[4 7] Average height of check variety, in cm. (use same check as abov

[2] Pod Position: 1 = Low (lower pods touching soil surface) 2 = High (lower pods not touching soil surface) 3 = Scattered (not concentrated high or low)

[1] Adaptability to machine harvest: 1 = Adapted 2 = Not Adap

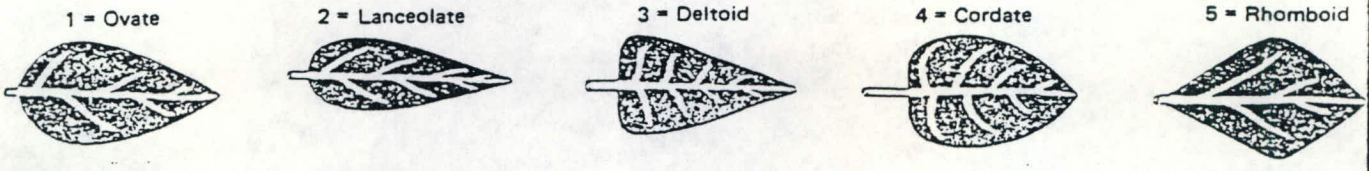
[2] Lodging resistance: 1 = Good 2 = Fair 3 = Poor

4. LEAFLET MORPHOLOGY (Use terminal leaflet of a fully expanded trifoliolate)

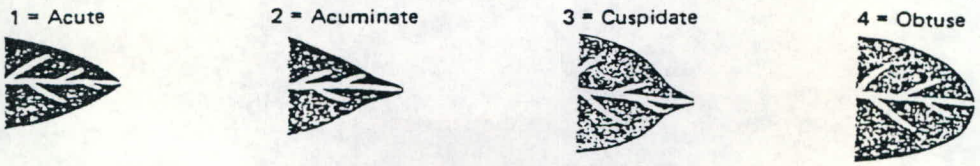
[2] 1 = Smooth; 2 = Wrinkled

[1] 1 = Dull; 2 = Glossy; 3 = Semiglossy; 4 = Variable

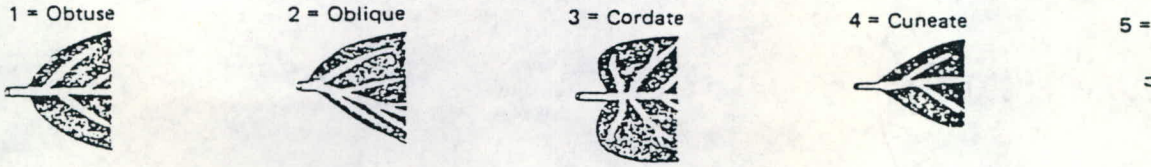
[1] SHAPE:



[2] APEX OF LEAFLET:



[1] BASE OF LEAFLET:



4

9000107

[5] COLOR OF STANDARD: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

[5] COLOR OF KEEL: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

[5] COLOR OF WINGS: 1 = White; 2 = Cream; 3 = Pink; 4 = Blue; 5 = Purple

[5][1] Days to 50% bloom

6. POD MORPHOLOGY (Green pod morphology optional)

Green | Mature

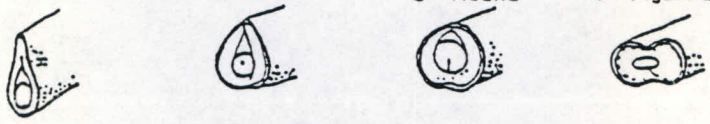
[ ] [1] COLOR PATTERN: 1 = Solid; 2 = Striped; 3 = Blotched; 4 = Mottled; 5 = Other _____

[ ] [1] PRIMARY COLOR: 1 = Purple; 2 = Red; 3 = Green; 4 = Yellow; 5 = Tan; 6 = Brown; 7 = Other _____

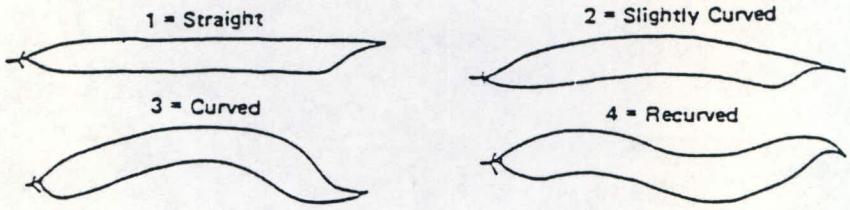
[ ] [3] COLOR MODIFIER: 1 = Light; 2 = Light Medium; 3 = Medium; 4 = Medium Dark; 5 = Dark

[ ] [6] SECONDARY COLOR: 1 = Purple; 2 = Red; 3 = Green; 4 = Yellow; 5 = Tan; 6 = Brown; 7 = Other _____

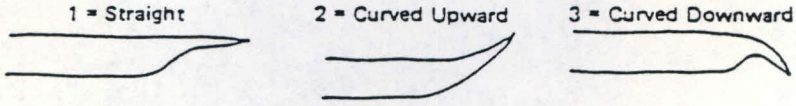
[ ] [1] CROSS SECTION SHAPE: 1 = Flat; 2 = Pear; 3 = Round; 4 = Figure Eight



[ ] [1] POD CURVATURE: 1 = Straight; 2 = Slightly Curved; 3 = Curved; 4 = Recurved



[ ] [3] POD BEAK ORIENTATION: 1 = Straight; 2 = Curved Upward; 3 = Curved Downward; 4 = Variable



Average beak length, in cm. _____

[ ] [1] CONSTRICTIONS: 1 = None; 2 = Slight; 3 = Deep

[ ] . [6] Average number of seeds per pod

7. SEED COLOR

[2] 1 = Shiny; 2 = Dull; 3 = Semishiny; 4 = Variable

[1] 1 = Monochrome; 2 = Polychrome

[1][0] PRIMARY COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other _____

[ ][ ] SECONDARY COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other _____

[1] COLOR PATTERN: 1 = Solid; 2 = Splashed; 3 = Mottled; 4 = Striped; 5 = Flecked; 6 = Dotted

[1] HILAR RING: 1 = Absent; 2 = Present

[ ][ ] HILAR RING COLOR: 1 = White; 2 = Yellow; 3 = Buff; 4 = Tan; 5 = Brown; 6 = Pink; 7 = Red; 8 = Purple; 9 = Blue; 10 = Black; 11 = Other _____

8. SEED SHAPE AND WEIGHT

[2] SHAPE OF SEED TAKEN FROM MIDDLE OF POD: 1 = Round; 2 = Oval; 3 = Cuboid; 4 = Kidney; 5 = Truncate Fastigiate

[2][2] Dry seed weight in g/100g seeds (adjusted to 12% moisture)

5

9. ANTHOCYANIN PIGMENTATION

9000107

1 = ABSENT
2 = PRESENT

[2] Flowers [2] Stems [1] Pods [2] Seeds

[1] Leaves [1] Petioles [2] Peduncles [2] Nodes

10. KNOWN DISEASE REACTION

DISEASES - COMMON NAME: Anthracnose, Rust, Powdery mildew, Fusarium root rot, Pythium root rot, Rhizoctonia root rot, Pyth wilt, Sclerotinia white mold, Angular leaf spot, Bacterial wilt, Halo blight, Fuscous blight, Common bacterial blight, Red node virus, Pc mottle virus, Bean common mosaic virus, Bean yellow mosaic virus, Curly top virus, Bacterial brown spot, Bean southern mosaic virus, Other (specify) _____

REACTION: 1 = Susceptible; 2 = Resistant; 3 = Tolerant; 4 = Avoidance

(Give the common name (CN), scientific name (SN), and race(s), where applicable)

[2] DISEASE: CN Anthracnose ; SN Colletotrichum lindemuthianum ; Race(s) Delta Epsilon Lambda Alpha Beta Gamma

[2] DISEASE: CN Bean Common Mosaic Virus ; SN None ; Race(s) All strains

[3] DISEASE: CN Rust ; SN Uromyces appendiculatus ; Race(s) Michigan isolates

[ ] DISEASE: CN _____ ; SN _____ ; Race(s) _____

[ ] DISEASE: CN _____ ; SN _____ ; Race(s) _____

[ ] DISEASE: CN _____ ; SN _____ ; Race(s) _____

11. KNOWN INSECT/NAMATODE RESISTANCE

PESTS - COMMON NAME: Aphids, Bean pod weevil, Bruchid beetle, Corn earworm, Flea beetle, Leaf hopper, Lesion nematode, Lyg Mexican bean beetle, Root knot nematode, Corn seed maggot, Spider mites, Thrips, Weevils, Western bean cutworm, Other (specify) _____

REACTION: 1 = Susceptible; 2 = Resistant; 3 = Tolerant; 4 = Avoidance

(Give the common name (CN), scientific name (SN), and biotype, where applicable)

[1] PEST: CN Leafhopper ; SN Empoasca fabae ; Biotype _____

[ ] PEST: CN _____ ; SN _____ ; Biotype _____

[ ] PEST: CN _____ ; SN _____ ; Biotype _____

12. KNOWN PHYSIOLOGICAL STRESS REACTION

1 = Susceptible; 2 = Resistant;
3 = Tolerant; 4 = Avoidance

[ ] Heat [ ] Cold [ ] Drought [2] Air Pollution

Nutrient toxicity or deficiency (specify nutrient) _____

Other _____

13. COMMENTS

EXHIBIT E
STATEMENT OF OWNERSHIP

Blackhawk was developed by a team of plant scientists in several departments under the Michigan Agricultural Experiment Station at Michigan State University working cooperatively with the Agricultural Research Service of the United States Department of Agriculture. The ownership rights are the property of Michigan State University.

Michigan State University

AGRICULTURAL EXPERIMENT STATION
Michigan State University

109 AGRICULTURE HALL
EAST LANSING, MICHIGAN 48824-1039
(517) 355-0123

OFFICE OF THE DIRECTOR

9000107

June 5, 1989

MEMORANDUM

TO: Vice President John Cantlon

FROM: Robert G. Gast

RE: Release of Black Bean Variety "Blackhawk"

I am attaching a copy of a memorandum I received from Dr. Eldor Paul, along with a signed variety release recommendation form; recommending that the dry bean variety "Blackhawk" be released. Since the variety was developed jointly with USDA-ARS scientists, a copy of the signed joint release notice is also attached indicating the USDA-ARS concurrence with the recommendation to release the variety.

It is also recommended that the release be made on a exclusive royalty bearing bases.

Blackhawk is recommended for release on the basis of its outstanding performance record in Michigan State University performance trials as well as its resistance to Bean Anthracnose. None of the present black bean varieties provide anthracnose resistance, thus this disease is often introduced into the Michigan dry bean area in black bean seedlots. The release and widespread use of Blackhawk could substantially reduce the incidence of this kind of disease introduction.

The recommending to release the variety is based on the background and pedigree information outlined in Dr. Paul's memorandum. The recommendation for release on an exclusive royalty bearing basis is based largely on he assessment that this method of release would most likely assure that an adequate supply of high quality seed would be available on a continuing basis allowing a rapid and widespread use of the variety.

Copies of signed agreements with the USDA/ARS authorizing the release on an exclusive royalty bearing basis are attached for your information.

Upon approval of the release we will proceed with identifying the most appropriate licensee and development of a license agreement for your consideration. We will also be recommending that an agreement be made with the Michigan Foundation Seed Association for that organization to provide the foundation seed class of this variety.

I support the proposed release of this variety and recommend approval by Vice President Roger Wilkinson and yourself. Assuming that you concur, please return a signed copy of the memorandum for our records.

John A. Cantlon — 6/16/89
Vice President for Research and Graduate Studies — Date

Roger Wilkinson — 6-16-89
Vice President for Business and Finance — Date

8

AGRICULTURAL RESEARCH SERVICE
WASHINGTON D.C.

9000107

AND

MICHIGAN AGRICULTURAL EXPERIMENT STATION
MICHIGAN STATE UNIVERSITY
E. LANSING, MICHIGAN

NOTICE OF NAMING AND RELEASE OF 'BLACKHAWK', A NEW TROPICAL BLACK BEAN FOR MICHIGAN AND THE GREAT LAKES REGION.

The United States Department of Agriculture, Agricultural Research Service and the Michigan Agricultural Experiment Station announce the joint release of BLACKHAWK, a new, erect, short vine type black bean with multiple disease resistance.

BLACKHAWK was tested as MSU No. B83302, and was derived from the following sequences of crosses: Tuscola/Cornell 49242/Black Magic/3/Midnight. Cornell 49242 is a black breeding line from Cornell University which carries the 'ARE' gene for resistance to six races of anthracnose. Anthracnose-resistant black seeded segregants resulting from the first cross were intermated with the commercial black bean cultivar Black Magic, and subsequently with Midnight to improve both architectural and agronomic performance. Selection number 80B015-68-02-02 entered yield trials in Saginaw, Michigan as an F_6 generation breeding line in 1983 and was coded with the permanent access number B83302.

BLACKHAWK was developed by the bean cultivar team at East Lansing, Michigan consisting of Dr. A.W. Saettler and Dr. G.L. Hosfield, of the Agricultural Research Service, U.S. Department of Agriculture, and Dr. M.W. Adams, (Emeritus), Dr. A. Ghaderi (retired), and Dr. J.D. Kelly of Michigan State University, Department of Crop and Soil Sciences.

BLACKHAWK has been tested for 6 years across 16 locations in Michigan and yielded an average of 22 cwt/acre. The new cultivar possesses an erect, type II plant habit with a short vine. It is similar in height, but exhibits more lodging resistance than present commerical cultivars. BLACKHAWK matures two days later than Domino and Black Magic and reaches harvest maturity 100 days after planting. BLACKHAWK produces a slightly larger seed than other commerical varieties, with a 100 seed weight of 23 grams. The processed seed color measured on the Hunter lightness or L-scale has a value of 15.2, which is equivalent to that of commercial black beans, indicating good color retention. Texture, drain weight and hydration ratios of BLACKHAWK are very similar to present commerical types when grown over the same seasons and locations.

BLACKHAWK carries the dominant I gene form of hypersensitive resistance to all strains of bean common mosaic virus. The new cultivar is highly resistant to all races of rust in Michigan, and also carries the ARE gene that confers resistance to the alpha, beta, gamma, delta, lambda, and epsilon races of anthracnose. Thus, BLACKHAWK is recognized as the first completely anthracnose resistant black bean available in the United States.

Seed for experimental purposes may be obtained form J.D. Kelly, Dept. of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824-1325. The Agricultural Research Service has no seed for distribution.

BLACKHAWK is being released on a joint exclusive release basis by the Agricultural Research Service and Michigan Agricultural Experiment Station.

Robt J Saettler — Jan 20, 1989

Director
Michigan Agricultural Experiment Station — Date

H L Flowman — JAN 31 1989

Administrator — Date

9